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Releasing the power to everyone.

Del Yocam, education, and the Apple II

On the first morning of Boston's AppleFest—Friday, May 20th—I had the opportunity to spend an hour with Del Yocam, chief operating officer of Apple Computer. Apple's chairman, John Sculley, once explained that the difference between what he and Yocam do is that his own time is focused on building Apple, while Yocam's is focused on running Apple.

Regular ***Open-Apple*** readers know that I've occasionally accused Apple of having no vision of where they're taking the Apple II family. If nothing else, my conversation with Yocam convinced me that he *does* have a vision for the Apple II. I'll let him tell you about it, as he told me:

Weishaar: Every time I ask someone at Apple who Apple's Apple II champions are, you're invariably on the list. Could you tell us a little bit about your background and how you developed this reputation as a champion of the Apple II?

Yocam: Part of it is that I've been at Apple for nine years. I started in 1979 when the company was relatively small. At that time the Apple II was the product undergoing all of the evolution, improvements, changes, and enhancements in design. I was a part of that right from the beginning.

In 1983, when we divisionalized right after John Sculley got there, I became General Manager of the Apple II group. Steve (Jobs) was General Manager of the Macintosh group. The next two years, from 1983 to 1985, were probably the most exciting time of my personal career. It was like having my own company under this corporate umbrella. Steve was focused a lot on the Macintosh and John was focused a lot with Steve, so I was really left to maneuver with an awful lot of freedom. We had just a phenomenal team, we were achieving basically all of the revenue and profits, and it was just an exciting time.

So, yes, I've been a champion of the Apple II and continue to be so. And, in 1985 I was able to incorporate Macintosh under that umbrella. So I'm a champion for both.

Weishaar: Didn't the Apple IIe come out at the beginning of that 1983 to 1985 period?

Yocam: The Apple IIe came out at the beginning of the period, and then the Apple IIc, and even the beginnings of the Apple IIgs. In fact, all of the initial development of putting the Apple II into one or two chips was a part of that regime. We did that with our Mega II chip—with a Mega II, a microprocessor, and some RAM you've got an Apple II that you can put in an automobile, or refrigerator, or whatever your mind allows you to explore.

Weishaar: But will we?

Yocam: I think anything is possible—anything and everything. It's interesting when I talk about the Apple II because probably for two-thirds of the world's population, the Apple II provides all the computing power that they'll ever need. The personal computer industry is so new—only 11 years basically—it will be interesting to look back after 50 years and see all of the impacts Apple II technology will have made in this world.

Weishaar: In that period when the IIgs was under development, there was rumored to have been some play back and forth about whether to continue with the 6502 microprocessor for the Apple II or to switch over to the 68000 used in the Macintosh. Is there anything concerning why you stuck with the 6502 that you can tell us about?

Yocam: We had a close relationship with Western Design, who had done the 6502. They made a strong case for wanting to take the Apple II to 16-bit technology and came up with the 65SC816, which would continue that line of microprocessors and allow us to do some things that we couldn't do if we started all over from a scratch with a new microprocessor family.

So we made the decision to stick with the 6502 technology—and you know, it was a long haul. It was two years, no, maybe 30 months, that it took us; working with them and getting their development to coincide with what we were doing with the Mega II chip; putting everything together. If you were to look at one of those boards of components prior to the Mega II and what we were able to consolidate down into one chip—it was phenomenal. It was our first effort in doing that at Apple, so it was quite a learning experience and very exciting.

I think it was the extension of the line that kept us using 6502 technology—being able to take with us those things from the past, the applications that had already been developed, and extend those, as well as being able to add new, more powerful applications. We wanted the Apple II to have the past as well as the future. While we wanted development in the 16-bit mode, we wanted to be able to run the 8-bit software also. So that was sort of the thinking at that time.

Weishaar: The impression I get, though, is that there were other people inside Apple who were arguing the other way and who were being taken seriously. What were their arguments?

Yocam: At that time the Lisa had been under development and introduced and Macintosh was coming along. There was a lot of talk about coprocessors and what you could do in merging the two lines. But I thought there were still too many unknowns at that time. With such major new product efforts going on with the Lisa and Macintosh—and there was a lot of dissension in those groups—boy, I wasn't going to



"I SAAIID WHAT COMPANY DO YOU REPRESENT?"

jump into coproduct development with either of the teams—Lisa or Macintosh.

Weishaar: One of the areas I wanted to talk to you about was Bill Mensch and his vision for the Apple II. We had him at a conference on GEnie a couple of weeks ago. He talked about the 65832, which will be based on the 65816 but include 32-bit instructions and a math coprocessor. He says he has no commitment from Apple that you will use the chip. But I guess the question extends—do you think the reasons you used the 65816 are still valid? If they are, it sounds like Mensch's new chip might be something that you'll use someday.

Yocam: Well, if I go back to when Bill was developing the 816 he really had no commitments from Apple in the early days...

Weishaar: Right, in fact he said that at one point someone from Apple told him Apple would never use the chip.

Yocam: Oh, I'm sure—we have so many individualists at Apple—that could easily have been said. I would say that it probably wasn't until the last year of his development on the 816 that it was obvious we had a partnership and that we were going to move ahead. I don't really remember how long into development it was because we had many conversations during that whole time period. He would be at Apple and we'd go down there to see what was going on. But I think it was later in the game that the real commitment came into play.

And I think it's still early in the game on the '832. I think we know more about the 68000 line today and we're certainly doing more research into future architectures within Apple. So I think there are more factors that come into play today as to what might be possible for the Apple II in the future. We'll just have to wait and see.

Weishaar: The other chip that he's working on is a 65816-based parallel processing chip. If what he's designing works, it looks like the Apple IIgs may be the first low-cost microcomputer that you could use for parallel processing experiments. He's working on an experimental board for the IIgs that will carry four of these chips. What he said was so wild I still can't figure out if he was joking—he said that his long-term goal was to compete head-to-head with Cray, using gallium arsenide technology, in a machine that is software compatible with the Apple II. Now there's some vision! Even if he's wrong by 90 per cent, we're talking about an Apple II with incredible power.

Yocam: I think it's mind-blowing. If he can pull that off it would be a phenomenal thing. Obviously I'm going to keep tabs on what's going on there.

Weishaar: The rest of the computer industry at the moment seems to be heading toward RISC technology, where you use one big, fast, simple chip at the heart of your computer. The Macintosh seems headed in that direction as well. Mensch's parallel processing technology, which uses many smaller, slower chips, puts Apple in a position to have one major product line based on RISC and a second major product line based on parallel processing. But that brings up the question, does even Apple have the resources to develop two product lines based on fundamentally different technology?

Yocam: My answer to that is to ask who's to say that Apple will only have two?

This year alone we're spending $250 million on research and development. There's an awful lot you can do with $250 million. One of the reasons we bought the Cray XMP-48 was to help us simulate future architectures. What's so phenomenal about having that speed and power and simulation capability is that you don't have to lay out the breadboards so early in the game, you don't have to physically build anything until you're really ready to do so. You can simulate and just save man-years. Every one of our engineers is hooked in to the Cray. What is phenomenal is all the thinking that can go on. There's a minimization of the physical construction needed to prove that one thing works over another or doesn't work.

When you've got all the minds that we have focused on various aspects of personal computing technology, it gets very exciting in what is possible for the future. Sure we're looking at RISC. Sure we're looking at other microprocessors. Sure we're looking at everything that is possible to continue this phenomenal growth in personal computing—whether it's the Apple II line or the Macintosh line or a future line. Do we have the resources? Last calendar year we were $3 billion, so you can just add on top of that. The growth has been phenomenal. We've had five quarters now of record growth—and profits.

Weishaar: At a meeting of Apple's user group advisory council earlier this year, John Sculley said, "What I would really like to seek your help on is finding ways to raise the priority and focus of the Apple II." Can you tell us about the things Apple is doing internally to raise the priority and focus of the Apple II?

Yocam: An awful lot, really. And probably more today than a year ago. There was a big focus in getting the IIgs out—we used a lot of resources. Since that time a lot has gone into the network. The education network has gone through so many evolutions—we wanted to bring it mainstream. It started off going one direction and Macintosh was going another. But we really wanted to bring it along so that the two could work together. The first parts of that were introduced in March and now have begun shipping. That has gotten a lot of the resources and attention. We also have, obviously, product development under way for the evolutions of our existing Apple II product line.

We are also announcing today the new AppleLink—Personal Edition, with Quantum, on the Apple II first. Macintosh is later this year, another six months away. We felt that the first utilization of an AppleLink-type system like the one we have internally should be on the home/education front. With Quantum and where their success lies, it made sense to do that product where we had our strength, which is in the Apple II product family.

The other thing that is very exciting for me is that there are over 100 new software products being introduced right here at AppleFest during these three days. And we'll see new hardware peripheral solutions.

While you may have seen the pendulum swing to Macintosh as we tried to become successful in the business market, I think the level of resources going on in the Apple II has been increasing as well. But because the focus on Macintosh has been so great, you haven't seen the attention on the Apple II visually—we've been at fault for that, Apple Computer has. We were trying so hard to establish ourselves in business that you haven't seen as much media coverage, as many advertisements in print on the Apple II. But it's paid off! All that attention on the Macintosh has paid off. We've become successful in business.

At the same time we have a billion-dollar-plus education business that's owed in large part to the Apple II; we have a billion-dollar-plus business in the Apple II itself! The resources are being applied there, and I think the pendulum now is coming back into equilibrium more than it had been.

We *had* to be successful in business, we *had* to be successful with Macintosh. That's what drives the overall faster growth for Apple Computer in total. Education grows at a slower rate. We've got to have the business market to fund future research and development. We've got to keep our gross margins at a place that allows us to put dollars into the future development of both product lines.

Weishaar: When Apple II users see what you've just described, they tend to panic. There's always a fear that you're about to give up on the Apple II.

Yocam: I get letters and AppleLinks asking about that all the time. In response, I delineate what we've delivered and allude to the future. I talk about, as I have with you, the fact that we had to be successful in business and that, obviously, there was a major thrust in that area. But that doesn't mean at all that we're abandoning or not spending as much on the Apple II. You'll have to determine that for yourself as you see the products come out over the next few years. This year alone there's been the network and now AppleLink—Personal Edition. I think when you add those things together you'll see there's an awful lot going on with the Apple II.

Weishaar: One of the things an Apple employee once told me when we were discussing these kinds of problems is that you have to realize that, inside Apple, the Macintosh is a talent magnet. A lot of Apple's best people move over to work on the Macintosh. Do you think that's true? If so, what are you doing to try to bring the talent back to the Apple II?

Yocam: There was a time after we reorganized into functional groups

in 1985 when statements like that could have been said—in 1985, early 1986. But I think the efforts in 1987 and 1988 are much more equalized. And then I think you have to add into the equation everything that's going on in our Advanced Technology Group.

There are different kinds of engineering activities. We now have a specific research activity for the type of engineer who wants to be part of the Advanced Technology Group, versus those who want to be delivering an ongoing product line like the Macintosh or the Apple II. So I think what you saw then—right after we functionalized, we had been so focused on Apple II, we had our own group, Macintosh had its own group—was our trying to synthesize and bring things together and do away with duplication. As a result, some of these frustrations came about.

Now you can apply almost that same kind of logic to what happens in ongoing product development, whether for the Apple II or Macintosh, versus what's going on in our Advanced Technology Group. That's a large organization now, doing research on new architectures, user interfaces, and so on.

I think its an ongoing evolution. To me it's never been a do or die, black or white kind of situation. To me it's an evolution—having a product that's twelve or thirteen years old and where it is in the product life cycle and having a new product, Macintosh, and where it is in the life cycle, and working on perhaps another new one, or several.

Weishaar: But in an interview a few years ago you said, "I've yet to find anyone who is willing to place an 'X' on where the Apple II is in its product life cycle."

Yocam: I've yet to find that. That's still a very true statement. And I think it goes right back to what I've said—for two-thirds of the world, maybe even more, the Apple II is really all the computing technology they'll ever need. Maybe that's not true in the twenty-second century, but I think it will be true for a good many years.

And don't forget that we continue to enhance the Apple II. The Apple II can become what we deem it should. And when I say "we," I don't just mean Apple Computer, I mean our users, and our developers, and our creators—like a Bill Mensch.

Weishaar: In the last few weeks the price of Macintosh Plus was dropped and starting this week there are also rebates on top of that. Your vice-president of marketing, Charles Bosenberg, said the price was cut to make the Macintosh more competitive in the home and education markets, traditional Apple II territory.

Yocam: We've been very focused over this last year, and it was at my direction, on establishing education and business marketing groups. I've long fought against the consumer market. It's just a jumbled up mess to me. I think the home is still a place of usage for either education or business. We don't have a critical mass of applications or usages to really say there's a consumer market. Maybe someday we will.

What we did was put the home market in both. The major focus of Apple is education and business, and the home market comes under both. We found that where we're still using those Apple IIs in the home is in education. Parents are buying Apple IIs for the kids. What's happening from a work place standpoint, now that we've become so successful in business, is that many people are buying Macintoshes for home.

It's the same kind of transition...being able to take work home, being able to do homework. At home on your Apple II, because you've got Apple II's especially in K through 8, but K through 12; or being able to take your work home and do it on a Macintosh at home.

We've wanted both product line families to have an entry point level. On the Apple II it's the IIc and on the Macintosh it's the Plus. We want to be very price-competitive at that entry point on both lines. We want to keep clones out, we want to keep our competition out, and we want to be successful there.

And if you look, both product lines have three product offerings. The Apple IIc, the IIe, and the IIgs at the high end; the Macintosh Plus, the SE, and the II. It's that kind of thinking that has permeated what we're doing. It was the first price reduction that we've had in almost 18 months. We decided to do it on the Macintosh Plus to continue to gain momentum in that home market for business. And also for home businesses. Not just taking work home—there's also a lot of businesses in homes. We're moving a lot of product for home businesses and it's Macintosh.

Weishaar: Have we given up on the Apple II for home business or for business in general?

Yocam: No. They do cross over a great deal. What we find is that Apple II and education are synonymous right now. Macintosh and business are synonymous—in big volume numbers. So it's just natural for us to push them that way into the home. But there's a lot of overlap.

I know a lot of businessmen who have been with Apple IIs since the day they started their business. In fact, I was just in a restaurant in Saratoga and the owner wanted to show me that he had just bought an Apple IIgs and was running his whole company on it. All of the inventories, account receivables, payables, employee data, and so on. He took me down—his actual office was in the basement—and here he had everything you could imagine for the Apple IIgs and he was running his company on it.

But remember though, when you're talking about a three-, going to five-billion-dollar company, we're going to focus on where we can cause the most impact with our advertising and media attention.

The thing you need to remember is that we still have a 60 per cent share of the K through 12 education market. A lot of people will say, well, that's because you were there first. But we continue to do an awful lot of work with the Apple II in education. Here at the show, for example, you can see demonstrations of ACOT, our Apple Classroom of Tomorrow program. We have working classrooms around the country. We want to learn what happens when teachers and students interact with personal computers. Apple II is the major focus there.

I have just learned that the state board of education in Indiana, along with the Lilly Foundation, Indiana Bell, and GTE, are looking at joining together to put computers in all fourth-grade classrooms, state-wide. All the students involved in the Indiana Fourth-Grade Project will also have computers at home. This is the first time we've seen community leaders, private industry, and public education come together to test the feasibility of in-home technology or to measure the impact of this technology on education and on economic development. This is a serious effort, one of the most far-reaching efforts here in the beginning stages of access to personal computers by every student. And they are choosing Apple II. I think there's a basis of validity for choosing Apple II in the education marketplace for lots of different reasons. All that we've put into the IIgs, the application base, now the network. It is the right choice. I'm going to follow this one very closely. It seems to be a very leading activity that's absolutely required in education. One that has both the private sector and the public sector, in a large way, working together to benefit the students in their state.

You have to put all of it together and in perspective when you look at what's going on in the Apple II market.

Weishaar: You take people like me, who have based their careers on the Apple II, and who, until recently, haven't been very interested in education—what I hear you saying is that if we want to be doing this ten years from now, we're going to have to get more nterested in education, because that's where your focus for the Apple II is going.

Yocam: Right.

Weishaar: And I'm dragging my feet, saying, but I want to do business!

Yocam: You're going to find Apple II in the home, there's no doubt about it. But Apple Computer Incorporated's thrust for the Apple II is going to be education. That spills over into the home, but we still don't have a critical mass of applications for the home that gives us a real valid consumer market.

Education is where our passion to change the world is! You know our identity. It's very clear. What do we do? We create great personal computer products. Why? Because we have a passion to change the world and we feel we can do it through our technology. How? We do it by creating an environment within Apple that allows each of us to achieve all that we can. And nowhere is that passion more expressed than in education. It's a subject that is very near and dear to my heart.

There's so much that needs to be done in the world of education. I just sat on an 18-month panel for the Office of Technology Assessment for the U.S. Congress on technology in K through 12 education. It was both a very educational experience for me and a very frustrat-

ing one. What do you think is the number one reason for our public education system? Number one is custodial.

Weishaar: Day care?

Yocam: Number two is learning. I just went bananas when I heard that. Here I had prominent educators all around me and I just went crazy. Of course they chalked that up to my naivety. It's just crazy to me. I know that personal computers are the first tools since text to facilitate learning. I've watched it happen in my own family. Just Wednesday I was in one of our ACOT sights. I go there to get rejuvenated by what can happen to new young minds once they get their hands on an Apple II. And it's just beginning! Just beginning.

The personal computer is going to be a tool in education just as paper and pencil have been a tool for ages now. If I can do anything about it, it will *not* go the way of other instructional aids—such as VCRs and televisions and tape recorders—it's going to be a mainstream tool. I talk about it all over the world! Where ever anybody will listen to me, I talk about the fact that to have positive social change in this country and the world we're going to have to have tools, like personal computers, to help people, not just work, but think, and learn, and communicate—I get all wrapped up in this.

If you want to parallel what we're doing and continue your success—our thrust is going to be in education for the Apple II.

Weishaar: Some of my subscribers in foreign countries—Sweden and Japan are two that I know of for sure, there may be others—say that the Apple II is no longer available in those countries.

Yocam: The Apple II, by and large, again, is an education product. In Australia we have a 60 per cent market share in education; in Canada, 30 per cent market share. In countries like France and the U.K., it's mainly a home computer. Macintosh, on the other hand, really started in Europe, from 1984 on, with a business-oriented direction. We've been very successful in business in Europe. A lot of that is a result of a willingness to integrate and have a multi-vendor environment in Europe. Here, on the other hand, IBM is such dominant force in business that it has taken time to develop a willingness to integrate. We've experimented a lot in Europe with Macintosh in business.

I think it's fair to say that Europe is predominantly Macintosh and Japan is Macintosh for all practical purposes. Whereas some of our earlier countries, such as Canada, Australia, France, and the U.K. have a greater Apple II presence. Sweden is a good example of a country we've just gotten serious about in the last two years, and yes, it's Macintosh.

Weishaar: You remember when they used to say that desktop publishing was just a Trojan Horse to get the Macintosh into business?

Yocam: It worked.

Weishaar: I wanted to ask whether, what with the new network, the Macintosh is just a Trojan Horse to get the Apple II into business?

Yocam: (chuckle)

Weishaar: Do you think it would happen? Do you think we'll see any solutions where the machines for users are Apple IIs connected to a network of Macintoshes and other computers?

Yocam: I think so much of it is the way we focus it. We obviously have developers focusing on business applications for Macintosh and education applications for Apple II and home for both as they pertain to business and education. So what is going to come to be will be, by and large, because of that focus. That's not to say there won't be innovative and creative new applications for both that are other than that.

So much of it is our focus. There's so much passion in our efforts for education. It makes so much sense for us to delineate the two, Mac for business, Apple II for education, because it gives us more critical mass to push what we want to see happen.

I left the interview with an impression of Yocam as an intelligent, reasonable man with a passion for education. And I'm pretty sure that Yocam left AppleFest with the impression that those of us on the front line where personal computers are making their way into the world would like to see Apple give the Apple II a bit more emphasis in business and productivity.

For example, at a breakfast for AppleFest exhibitors the morning after I interviewed him, Yocam spoke and then opened the floor to questions. Barney Stone of Stone Edge Technologies, publisher of *DB Master*, made an impassioned plea that Apple give the Apple II at least as much entry into the business market as it's given the Macintosh in the education market. Yocam said he was listening. And I think he was.

Apple's division of the computer world into business and education markets is sensible. Making the Macintosh its primary machine in the business market and the Apple II its primary machine in the education market makes sense, too. I even think that positioning the Macintosh at the high end of the education market—in universities and now high schools—makes sense.

What I *can't* understand is why Apple continues to go out of its way to keep the Apple II out of the low end of the business market. Now that we're beginning to see productivity programs for the Apple II that use the Apple interface, now that we have utilities that can easily convert disks between ProDOS and Macintosh format, it's time for Apple to boost the Apple II—not the Macintosh—as its machine for the low-end work-at-home and small business markets, just as it pushes the Macintosh in the high-end of the education market.

If we do see computers on every student's desk someday, they will ultimately be there as tools for general productivity. If Apple continues to position the Apple II as a specialized education machine rather than as a generalized, multi-purpose productivity tool, I, for one, foresee those desks filled with computers other than Apple IIs.

AppleFest Highlights

As Del Yocam mentions in this month's interview, Apple introduced a new online service called **AppleLink—Personal Edition** at Boston's AppleFest in mid-May. We talked a little about the new AppleLink here in February (page 4.1). Without it, ***Open-Apple*** wouldn't be involved with GEnie.

AppleLink—Personal Edition was jointly developed and is co-marketed by Apple and a company called Quantum Computer Services. Quantum specializes in developing system-specific online computer services. Its initial product, Q-Link, was introduced in November 1985 and is designed for owners of Commodore 64 and 128 computers. AppleLink—Personal Edition, though announced at AppleFest, isn't expected to "ship" until later this summer.

The Apple II version of AppleLink—Personal Edition requires a 128K enhanced IIe, a IIc, or a IIgs. AppleLink packages, including software and an account number, will be sold through Apple's U.S. dealer network at a suggested retail price of $35. In the AppleLink box you'll get an account number and communications software for your Apple II that you must use to access the system. This special software will simplify some of the complexity new users encounter when trying to go online.

The service will not be available outside North America There is a recurring $35 annual fee. Hourly rates are $6 per hour evenings and weekends and $15 per hour during the day—300 to 2400 baud.

I feel just like Apple did when IBM announced its first personal computer. Welcome AppleLink! It was Apple's corporate interest in telecommunications that convinced me that the online service industry was finally starting to mature and that ***Open-Apple*** should get involved (study the history of this industry over the last decade and you'll find three or four dead and abandoned services for each one that succeeded). Apple's interest validates what many people over the years have sensed—that public-access computer networks have a great deal of potential to inform, to entertain, and to do good. Now, to release that potential...

The Floating Point Engine was one of a number of other exciting new products at AppleFest. This one is a small $200 card for any slotted II. The card holds a Motorola MC68881 floating point math coprocessor—the same one Apple uses in the Macintosh II. Unless you've learned assembly language you may not know it, but the microprocessors used in Apple IIs can't actually multiply or divide. Assembly language programmers have to work multiplication and division problems out long hand, using the microprocessor's addition and subtraction commands. This process makes math operations take a relatively long time to execute, particularly for values with a reasonable number of digits of precision.

A math coprocessor, on the other hand, can multiply and divide even multiple-digit numbers very rapidly. Thus, this card would speed up programs that a.) use it and b.) that do a lot of floating point math operations. Since there are all kinds of programs that do a lot of floating point math, the catch at the moment is clause "a". But Innovative Systems, creator of The Floating Point Engine, is working on an interface between the floating point toolbox built into the IIgs (SANE—Standard Apple Numerics Environment) and the Floating Point Engine. Availability of this interface would mean that *any* ProDOS 16 program that used the built-in SANE toolbox would automatically use the floating point card, if installed, instead. (And now we see the beauty of the toolbox approach to system software.)

It would be much more difficult to adapt Applesoft so that existing Applesoft programs could use the card without being rewritten. It could probably be done, however, with a set of special modifications to the ProDOS 8 kernel. You'd need to store a modified version of Applesoft, which would use the floating point card, in "language card" RAM. Since the ProDOS kernel also uses that space, our specially modified ProDOS would have to copy itself into that RAM each time ProDOS was called. And it would have to recopy the modified Applesoft back when ProDOS was done. This "brute-force bank-switching" would slow down disk-intensive programs, but would be transparent to existing Applesoft programs, and might provide a net speed increase to math-intensive software.

Another possibility would be to talk Alan Bird into coming up with a special version of the *Beagle Compiler* that uses the card. The *Beagle Compiler* itself already speeds up everything about Applesoft except floating point math. The Floating Point Engine is available now from Innovative Systems, P.O. Box 444, Severn, MD 21144-0444.

***Diversi-Tune*, which turns an Apple IIgs into a MIDI synthesizer, recording studio, and hi-fi system,** also created a stir. Unlike music programs that create sounds based on notes you place on a staff, *Diversi-Tune* creates sounds based on notes a musician plays on a MIDI keyboard. It can record the musician's notes, synthesize the notes into music you can hear, and mix notes and resend them out 32 MIDI channels—all at the same time.

Most users of *Diversi-Tune* will probably use it simply to listen to pre-recorded music, which can be stored in ProDOS files that are full of MIDI notes (each note is an 8-digit hexadecimal number). Bill Basham, the author and publisher of *Diversi-Tune*, has several song disks available. When used this way, *Diversi-Tune* turns the Apple IIgs into part of your hi-fi system. One advantage this part has is that, like a CD player, the music is stored digitally and won't degrade over time. Another is that the words of songs can be stored along with the musical notes. Two of the screen displays available while *Diversi-Tune* is playing show the words of the song being played and a bouncing ball. Other displays show a piano keyboard with the notes being played and either a graph of the key velocity of each note, a "player piano" display, or raw MIDI data. A disadvantage, compared to hi-fi, is that only notes can be recorded. All singing must be live.



Ask (or tell) Uncle DOS

'Ol Uncle DOS just found his stack of cards and letters having to do with corrections, boys and girls. Some of this stuff got a little old while the stack was lost, but it's all worth reprinting.

Bret Pettichord sent us a correction to a correction, "thus validating Weishaar's law" (page 4.15). On page 3.69 in last October's issue, about two-thirds of the way down the first column, I revoked an AppleWorks patch that was supposed to fix a subdirectory bug but didn't. I got the page number of the revoked patch wrong–it's really 3.56, not 2.56.

In the May issue, page 4.32, in "Subdirectory bug fixed at last" (yep, same bug) there's a ",T$00" missing from the last line of the patch. You can pencil it in at the end of that line. Thanks to Glenn Dahlen for reporting this one.

Also in the May issue, page 4.30, top of the third column, the zip code for Kitchen Sink Software starts with "43", not "45".

Last month, near the top of the second column on page 4.35, I said you could find Glen Bredon's virus detector on GEnie by searching with the keyword "Apple.Rx". Doug Attig points out that doesn't work. But "Rx" will, or you can search for uploads by BREDON.

*David Lyons reports that his program **P8CDA**, which loads IIgs Classic Desk Accessories from ProDOS 8, is no longer shareware, as reported last month on page 4.38 ("Loading desk accessories"). It's now available as a commercial product from Roger Wagner Software for $29.95 (1050 Pioneer Way, Suite P, El Cajon, CA 92020 619-442-0522).*

Lyons also sent us a patch to fix the AppleWorks/ProDOS 16 New Desk Accessory bug mentioned in our April issue near the top of the third column on page 4.21. The fix is for unmodified versions of AppleWorks 2.0 only and consists of putting four bytes of NOP (no operation) codes starting at byte $1489 of APLWORKS.SYSTEM, like this:

```
FOR I=768 TO 771: POKE I,234: NEXT
BSAVE APLWORKS.SYSTEM,TSYS,A768,L4,B$1489
```

*Lyons adds, "It was easy to find the right place to patch--the terminally curious will want to BLOAD APLWORKS.SYSTEM,TSYS, A$2000 and then search for tool calls using the Monitor command "\22 00 00 E1\<0/ 2000.5000P". Of course, this sort of thing is much more fun with a CDA I wrote called **Nifty List.**"*

*Lyons' desk accessory disassembles machine code, as the IIgs Monitor's "L" command does, except that **names** are displayed for tool calls, ProDOS 8 calls, and ProDOS 16 calls. There are also commands for visiting the Monitor, displaying tool set version numbers (and other tool set information), and displaying memory manager information. **Nifty List** is still shareware ($15), is currently in version 2.22, and is available in user group and online libraries everywhere (on GEnie search for the keyword "nifty"), as well as directly from Lyons at DAL Systems, P.O. Box 287, North Liberty, IA 52317.*

Desk accessory limits

I'd like to know the maximum number of NDAs and CDAs you can install, respectively, on the Apple IIgs. I have a whole collection of them and I want to make sure I won't crash my system if I install too many.

W.M. Tan
Singapore

There is no limit to the number of NDAs you can put in your system disk's DESK.ACCS subdirectory. However, only the first 15 or so will show up in the desk accessory or "apple" menu when you select it. (The exact number depends on how many items the application software you are using puts in the apple menu itself; the menu doesn't scroll; with the default system font there's room for 16 items).

*However, you can double this with a shareware ($5) desk accessory called **Two Apples.** Select this accessory and it will add a second apple to your application's menu bar. The next sixteen NDAs in DESK.ACCS can be selected from this menu. **Two Apples** is available in all the usual shareware places (current version is 1.2—on GEnie, search with the keyword "two.apples") or from the author, Tim Swihart (P.O. Box 122512, Ft Worth, TX 76121). Swihart, incidentally, is half of the team that runs the Apple II Programmers and Developers RoundTable on GEnie.*

*Likewise, the CDA display screen allows a limited number of entries. And three of these will always be "Control Panel", "Alternate Display Mode", and "Quit". However, Glen Bredon has written a freeware (no fees, but not public domain, either) utility called **Master CDA** that allows you to combine up to 100 CDAs in a single menu item. And you can put ten **Master CDAs** on the CDA screen at once, which would give you a theoretical limit of over 1,000 CDAs (if you have the memory and the time to learn how to use them all). **Master CDA** is also available in all the usual places. (On GEnie it is one of several CDAs Bredon has combined into a single file—search for uploads by BREDON **and** the keyword "CDA".*

The real limit to the number of desk accessories you can have is the amount of memory available on your IIgs and on how much memory the particular desk accessories you choose use up.

Rethinking hard disks

With current RAM chip prices, do we need to rethink the hard disk situation?

David S. Levine
Green Valley, Ariz.

*Here at **Open-Apple**, we've been recom-*

Musicians, however, wouldn't have *Diversi-Tune* long before they'd try to use it as a recorder. This requires a MIDI keyboard and a MIDI interface for the IIgs. *Diversi-Tune* can record 32 "tracks" for one piece of music. The tracks can be recorded separately. They can be played back through the IIgs synthesizer or through the MIDI-out ports. Tracks can be "edited" to remove mistakes by playing new notes over the top of old ones.

Diversi-Tune records what a musician actually plays. It doesn't force a tempo and it can record how hard a key was pressed. It brings schools more power to help students become better musicians and it brings musicians the power of a recording studio for making music. *Diversi-Tune* is available for $55 from Diversified Software Research, 34880 Bunker Hill, Farmington, MI 48331-3236. A site license for an entire school district is $550. A demonstration disk is $5.

Beagle Bros came to AppleFest with four new Timeout modules for AppleWorks and a significant upgrade for two others. The upgrade is a hi-res/double-hi-res paint program that has been added to *Timeout Superfonts* and *Timeout Graph* (send $20 and your original disk for an update). Three of the new modules were written by the MacroMan, Randy Brandt. One of these, *Timeout Powerpack,* allows up to 36 files on the desktop instead of 12, creates three independent clipboards, and can turn AppleWorks into a program selector (when you exit the selected program, control returns to AppleWorks) among many other features. The fourth new module is *Timeout Thesaurus* by Alan Bird. Like Bird's *Timeout Quickspell,* the thesaurus fits into AppleWorks as if it had always been there—you see no seams.

StyleWare came to AppleFest with pre-release copies of a new program called *GSWorks*. StyleWare's ad for *GSWorks* ends with the line, "Because AppleWorks was then. And *GSWorks* is now." Unfortunately, until the program actually begins shipping later this year, the line should read "Because AppleWorks is now. And *GSWorks* is tomorrow."

But if StyleWare can actually ship a product that fulfills its ambitious plans for *GSWorks,* I think it will have the first ProDOS 16 blockbuster on its hands. *GSWorks* takes the best part of AppleWorks—a true integrated desktop—and mixes it with Apple's desktop interface. To the AppleWorks word processor, StyleWare says it will add fonts, print styles, character sizes, what-you-see-is-what-you-get, a spelling checker, and a thesaurus. To the AppleWorks spreadsheet, StyleWare says it will add intelligent recalculation and color charting. Beyond AppleWorks, StyleWare says *GSWorks* will also include a graphics module that combines features of draw and paint programs; a desktop-publishing module that allows combining graphics and text for printing; and a communications module for connecting to the world.

Don't expect AppleWorks to shrivel up and die, however. A text-screen based program will always be faster than a graphics-based program. Likewise, printing will always be faster with AppleWorks. StyleWare doesn't say anything about macros, which have become an essential part of AppleWorks to many users. And *GSWorks* requires an Apple IIgs. But if StyleWare can create what it wants to create, *GSWorks* will be all the software most IIgs users will ever need.

mending RAMdisks over hard disks for most users since November 1986 ("Cheap hard drive alternatives," page 2.77; "RamFactor as hard disk," page 2.86; "The AppleWorks machine," page 3.44). However, given the recent increases in RAM prices and the continuing evolution in the price and performance of hard disks, all that has changed. As of this month we are recommending hard disks over RAMdisks.

As I was leaving my meeting with Del Yocam at AppleFest, I had a couple of minutes left. Thinking that the chief operating officer of a $3 billion company that has RAM chips at the heart of most of its products might have some relevant insights, I asked Yocam what's going on with RAM prices. Here's his response:

I'm very close to that—I just got back from Japan. Several things have happened, not the least of which is the Semiconductor Trade Pact, which has created havoc for us. The U.S. only has two manufacturers of dynamic RAMs left, Texas Instruments and Micron. The rest is Japanese and now Korean. What happened in Japan is that they are not—even today—anticipating the growth we are. They're taking mainframes, minis, and personal computers together and projecting something like 20 per cent growth. I'm over there saying, wait a minute, we're anticipating 200 or 300 per cent growth! Also, the transition from 256K chips to 1 meg chips isn't going well—they didn't put enough capital in early enough to make a clean transition.

As a result we've got this horrendous situation that's probably going to continue for a little longer than people have anticipated. First people said it was going to be six months, now we're saying it could go into the first six months of 1989. I've got people stationed at all the companies we do business with to make sure that we have mind share. We have long-term contracts. We were with them in the rough times and we expect to get, and we are getting, our share. But we work the issue daily. And we're looking at longer term strategic decisions we may have to make to be sure we have the supply we need in the future.

If you're looking for a hard disk, my opinion is that you should get a SCSI (say "scuzzy") drive that will work with Apple's SCSI card. "SCSI" is a type of interface. One of its primary features is that up to seven different devices can be connected to one SCSI card on your Apple II by linking them together in a daisy chain.

Apple has already announced a SCSI CD-ROM drive and a SCSI LaserWriter printer in addition to its family of SCSI hard drives. More devices are possible, as is a built-in SCSI port on the next generation of Apple IIs. The advantage of getting a SCSI hard drive that will work with one of Apple's SCSI cards now is that you'll be able to connect other SCSI devices to the chain later without using up another slot or paying for another interface card. Slots, particularly on the Apple IIgs, continue to be in even shorter supply than RAM chips.

There are essentially three different types of hard drives in the Apple II market. First Class Peripherals offers a family of non-SCSI drives. As long as you have a slot for them, these are good drives. These non-SCSI drives make up the first type.

The second type consists of SCSI drives that aren't compatible with Apple's SCSI card for the Apple II. Theoretically, any Macintosh SCSI drive should work on an Apple II. Incredibly, however, none of companies that make Macintosh SCSI drives will promise this is so. If you buy one and something goes wrong, you're stuck. In addition, some of these drives can only be given a "low-level" format on a Macintosh. Some users have gotten around this by first formatting the drive using a Macintosh, then switching the drive to an Apple II and reformatting it for ProDOS with Apple's system utilities. However, until the Macintosh companies are willing to take the Apple II seriously, we recommend you avoid them.

*CMS offers a family of SCSI drives for the Apple II. We have a couple of their 60 meg models at **Open-Apple** and have nothing but praise for their size, speed, reliability, and noise level. The SCSI interface card CMS uses with its drives isn't compatible with Apple's SCSI card for the Apple II, however. That throws a dark cloud over the CMS line.*

The third type of hard drive available for the Apple II consists of Apple-compatible SCSI drives. At the moment we know of only two companies producing this type of drive. One is Apple itself, but Apple's prices on hard drives are way beyond the limits of what's reasonable.

All that leaves us with just one company, Chinook Technology (601 Main St, #635, Longmont, CO 80501 303-678-5544). Chinook's $650, 20 meg SCSI drive for the Apple II works with Apple's SCSI card, although Chinook also bundles its own card with the drive. For more on Chinook, see last month's newsletter (page 4.36).

Frozen video

In the April issue of *Computist,* page 25, a contributor describes the following problem: "Here's a wicked little puzzle, which is likely to be of more than passing interest to a few IIgs types. On a cool autumn morning, a few weeks after getting the IIgs ROM upgrade, you turn on your computer. Instead of booting it plays around with the drives and then locks up with a screen full of garbage. But if you wait twenty to thirty seconds, turn off the machine, and try again, everything works fine."

The contributor goes on to say that he isolated the problem to a "bad video chip" that malfunctions at low room temperature, but works fine after a just a little warm-up. He suggested that if you have this type of problem after the ROM upgrade, to try to get your dealer to swap the video chip.

I have this same problem with my IIgs. I showed the article to my dealer, who promptly called Apple. Apple disavowed any knowledge of the problem. Without support from Apple, my dealer is reluctant to swap video chips.

Chuck Zamzow
Battle Creek, Mich.

We haven't heard of this one. The easiest solution, particularly if your upgrade is out of warranty and you'll have to pay for a fix, is to figure out a way to live with it. You could leave your computer on all the time when the weather is cool, or maybe you could buy the video chip a little blanket. (Editor's note: Uncle DOS is kidding about the blanket.)

If the upgrade is still in warranty, on the other hand, or if you have an AppleCare service contract, the next step is to figure out how to reliably reproduce the problem. Forget trying to prove it's the video chip—just prove you have a problem and get a whole new motherboard.

It sounds a little crazy, but if you can get your IIgs to freeze up reliably by putting it in a refrigerator for twenty minutes, that should be proof enough that cold mornings cause you problems.

Meanwhile, we'll put the ***Open-Apple*** *subscriber task force on this and see if we can find more computers with this problem.*

Don't dial 911

About four months ago I was working on my IIgs when suddenly the screen flashed "Fatal System Error—> 0911". When I attempted to reboot using open-apple/control/reset, I kept getting the same fatal error. Finally I turned the machine off for 30 minutes. When I turned it back on the problem was gone.

Two weeks ago it happened again while I was using AppleWorks. I went digging into the toolbox reference manuals and found this error comes from the Apple Desktop Bus tool set (tool set $09). Error $11 stands for "can't synchronize with the system". It sounds like the ADB hardware gets out of synch with the rest of the IIgs and can't get back on track unless you turn the machine off.

Is this a problem with my particular unit or is it a genetic defect within the IIgs?

Sven Barzanallana
El Paso, Texas

As IIgs fatal system errors go, number 911 seems to be one of the more common to pop up. I haven't ever seen it on my IIgs, but Dennis has seen it several times. He's starting to think it's related to power supply instability. The error seems to occur mostly on machines that are loaded with drives or cards or are pretty warm.

I guess it's time to put the subscriber task force out on this one, too. Could those of you who get this error tell us about your machines and what you were doing when the message appeared?

IIgs: /RAM5, monochrome

AppleWorks seems to have a bit of trouble handling different minimum and maximum RAMdisk settings on the IIgs. Say the minimum is zero. Then you run AppleWorks and it says "xxxxK available." If you create a large file (more than half of xxxxK) and save it to /RAM5, an error will occur. Next AppleWorks will ask you to insert the program disk even though the disk is already in the drive. Now you'll have to reboot.

You mentioned the use of the colour/monochrome setting in the Control Panel (February, page 4.3). Mastertype's *Writer* is virtually unusable on the IIgs because of colour bleach on the standard hi-res screen. I think the cure you mentioned needs to be emphasized: from Applesoft, flip the double-hi-res switch with a POKE 49246,0. Use the Control Panel to set the display to "monochrome." Then boot with a PR#6 (not open-apple/control/reset). Voila, all the text is razor sharp. This is also useful for some programs such as *Colossus IV* and *Chessmaster 2000.*

I am very disappointed with *Music Construction Set IIgs,* not because of its various limitations, but because of its way of obtaining memory—grab it all, including that allocated to /RAM5, just like *Diversi-Copy.* There's not even a Quit command.

Nenjun Siew
Boxhill North, Vic.

A number of people recommend setting the IIgs RAMdisk minimum and maximum to the same number to avoid problems such as the one you mention with AppleWorks. In fact, some people have begun to think that the best solution is to set both minimum and maximum to zero. This works best if you use primarily ProDOS 16 programs.

Danish t0 g0

I don't know if you can stand another letter about slashed zeros (March, page 4.16; April, page 4.20; May, page 4.29), but once you have the control-@ problem in AppleWorks 2.0 solved, it's possible to install foreign language ImageWriters into AppleWorks, with slashed zeros, that preserve single spacing. Just enter the following code sequence after the CTRL-I 80N in the interface cards option, and replace the "x" and "y" with the letters shown, for the foreign language you want:

```
ESC D CTRL-x CTRL-A ESC Z CTRL-y CTRL-@

British  - x=C y=D          German   - x=D y=C
French   - x=F y=A          Swedish  - x=E y=B
Italian  - x=A y=F          Spanish  - x=G y=@
Danish   - x=B y=E          American - x=@ y=G
```

Of course you can only have three AppleWorks printers at one time. The ESC D sequence must come before the ESC Z sequence or you'll be double spacing. This happens to be the opposite of what's shown in the *ImageWriter II Owner's Manual.*

If you want the language but not the slashed zeros, change the CTRL-A in the sequence to CTRL-@.

You can return to whatever language your printer defaults to, which is determined by how you have the printer's internal dip switches set, by turning it off and back on again. But you can save wear and tear on the switch by installing a printer that switches back to your default language.

If you have a IIgs, you can display on your screen the same foreign characters that the ImageWriter prints. Just enter the Control Panel's option menu and choose the appropriate language.

Bruce Ristow
Rochester, N.Y.

You're right, the ImageWriter II manual does have these backwards. For those who are interested in knowing why, take a look at "Slashed zeros and 8 bits" in our March 1987 issue, page 3.14, and the other articles it refers to.

Slashed zeros and the IIc...

By now you probably have hundreds of letters about slashed zeros that don't work, and here's another. I don't think there's a way to get them using a IIc.

On a IIc, AppleWorks doesn't list an interface card option. If you find a way to send the codes, please let me know.

Andrew Prinster
Grand Junction, Colo.

Take an otherwise blank spreadsheet and enter open-apple-O(ptions), SC (send special codes to printer). Enter the codes published above for slashed zeros. Print the spreadsheet. Don't forget to save it for future use, too.

You'll also need to refer to our May issue, page 4.29, to find out how to sneak control-@ in as a printer code.

Apple II-aided design (cont)

Thanks for mentioning our program *CADDRAW* in your May issue (page 4.30). However, I don't think any of the programs you mentioned will allow "pulling" of curves, if that is what Mr. Keenan needs. As a drafting teacher and as the author of *CADDRAW,* I have seen and read about many CAD systems for the Apple II. I would be more than happy to assist any of your subscribers in selecting a graphics/CAD package that will meet their needs. It's best to call after 3:30 eastern time except during that glorious period teachers generally refer to as summer, when I can usually be reached after 9 am eastern time.

Guy Forsythe
Kitchen Sink Software
903 Knebworth Ct
Westerville, OH 43081
614-891-2111

Zip arrives

Could Open-Apple cover the curious case of the speed-up chips, by Zip Technologies *and* others, from a technical viewpoint? I know they're finally shipping, but why did it take so long?

Robert Lema
San Andreas, Calif.

We've finally gotten a Zip Chip for review. It's shipping, but still not in quantities large enough to fill all the demand. Zip Technologies has repeatedly said that it has encountered unexpected delays in having the chips manufactured, and we have no reason to doubt them, particularly with all the other crazy things that are going on in the world of chips.

The Zip Chip is essentially an MCT SpeedDemon that you can plug into the Apple II's microprocessor socket. I talked at length about this accelerator card back in September 1985, page 1.69. For a complete technical description of how the new device works, see Peter and Allen Baum's "Speaking of Hardware" column in the May ***Call -A.P.P.L.E.,*** *pages 50-53.*

A similar device, called the Rocket Chip, was announced at AppleFest by Bits & Pieces Technology (31332 Via Colinas, Suite 110, Westlake Village, CA 91362). However, this chip isn't shipping at all yet. When we get one, we'll compare it to our Zip Chip, which we currently have installed a IIc—it works!—and to an Applied Engineering TransWarp.

IIc crystal ball

What do you see in the future for the IIc, specifically, hard drives, 3.5 disks, the Zip Chip, and so on. Will it be worth the expense and effort?

Robert Hopkins
Eielson AFB, Alaska

As always, the answer begins with the question, what do you want to do with your computer? For example, if AppleWorks, the Timeout series, and other non-IIgs software satisfy all your needs, the IIc is a great little computer. If you think you really want to run GSWorks, on the other hand, you need a IIgs, not a IIc.

Next the answer moves to the question, do you already own a IIc or are you thinking of buying a new one? It's hard to recommend buying a new IIc right now because the machine is nearing the end of its life-cycle.

If you like everything about the IIc and are interested in a new one, first take a close look at the Laser 128EX (Laser Computers, 550 E Main St, Lake Zurich, IL 60047 312-540-8911). The EX has everything the IIc has plus added features such as an accelerator, a parallel printer port, and a numeric keypad. More importantly, it costs about half as much as a IIc. I bought one of the early Laser 128s right after they were introduced two-and-a-half years ago (see March 1986, page 2.10). It didn't seem as solidly built as a real IIc, but since then, with the exception of one power supply (the brick that sits on the floor) that died, it has survived steady use by my wife and her research assistants. Nowadays I think it's important to support Laser so that Apple has a reason to improve the IIc.

If you aren't thinking about buying a new computer, on the other hand, but already own an older IIc, you can get a motherboard upgrade free from your dealer if you buy an Apple 3.5 drive or a memory expansion card. Today's IIc supports both. Add a Zip Chip or a Rocket Chip and you've got a very powerful AppleWorks machine.

At the moment there aren't any companies that we know of making IIc hard drives, although such drives have been manufactured in the past by Quark and ProApp and may be available as used equipment. Chinook Technology, mentioned earlier, is considering building such a drive, but hasn't yet reached a decision. The disadvantage of such a drive is that, if you later decide to upgrade to a IIgs or something newer, the hard drive, like your speed-up chip, won't work with your new computer. All your other IIc equipment, however—5.25 and 3.5 drives, modems, printers, monitors—work just fine on newer computers.

Open-Apple

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65802 questions

If my IIc has the new ROMs, do I have a 65C02 or a 65802?

Eric Miller
Dallas, Texas

Is there any reason why one should not replace a 65C02 with a 65802 other than there isn't a lot of software available that uses it? I'm a user and lover of the *Merlin 8/16* assembler, which can create object code for the 65802. I don't expect the 65802 to turn my IIe into a IIgs, but with some specialized software could it increase the speed of certain applications?

Frank L. Eddy
Ogden, Utah

Apple doesn't use the 65802 in any of its current products, including the IIc with new ROMs. However, there's no harm done by plugging one in—neither your computer nor your existing software will be able to tell the difference.

If you choose to write your own software that uses all the abilities of the 65802, that software should run faster than if you limited yourself to the 6502's abilities. We don't know how much faster, however, in part because it would depend on your program. Some operations might occur several times faster, while others might not be much faster at all.

AppleFests of the future

Do you have dates and places for upcoming AppleFests? I might be able to hook one into a trip to the coast.

David Brown
Kansas City, Mo.

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San Francisco: September 16-18, 1988
Boston: May 5-7, 1989
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We've also heard talk of a midwestern AppleFest for 1989, but none of it was definite. For more information, contact Cambridge Marketing at 617-860-7100.

Orange Micro (cont)

In "Orange Micro converted limited" in the May issue, pages 4.30-31, a reader says that the C/Mac/GS interface cannot produce superscript or subscript. This is true if you send the ImageWriter codes for these functions, however, if you try to do it from within AppleWorks, superscripts and subscripts will print properly. AppleWorks doesn't use the built-in ImageWriter codes for this, but shifts the paper up or down about half a line.

With my C/Mac/GS interface and Epson FX-86e printer, I could actually see the printer do the reverse linefeeds necessary to accomplish this. This was very interesting because the Epson manual doesn't mention a reverse linefeed control sequence anywhere. By putting the printer in hex dump mode, I was able to determine that the sequence ESC $6A nn, which is not documented, performs a nn/216th inch reverse linefeed on my Epson. ESC $4A nn performs the same size of forward linefeed. Note that $4A is "J" while $6A is "j".

The C/Mac/GS box seems to have been designed to handle everything AppleWorks can send it, but some of the standard ImageWriter II sequences have been left out. It also handles graphics well and will print super-hi-res IIgs screens sent by the print manager in ImageWriter format.

Hugh McKay
Montreal

Open-Apple vs. GEnie

A large part of the last several issues has been devoted to GEnie. I'm worried that your time and attention will be directed at GEnie first and at producing pithy, intelligent, helpful, thought-provoking issues of ***Open-Apple*** second. Should I be worried?

Robert Shank
San Mateo, Calif.

No, we're over the hump now. For awhile there I had to invest a lot of time in learning how to use GEnie myself and, as a result, I didn't have any time to figure out anything else to write about. But GEnie is under control now. I still intend to write an article about uploading and downloading files for a future issue, but it should be useful no matter what service you use.

I continue to see the ***Open-Apple****/GEnie alliance as a win-win situation for subscribers of both services. Dennis and I feel we now have better answers for many of your questions because of the information, software, and user expertise readily available to us on GEnie.*

GEnie, on the other hand, has benefited from an influx of ***Open-Apple*** *readers (****Open-Apple's*** *Don DeSorte signed up as GEnie's 100,000th subscriber in mid-March and received 50 hours of connect time and a trip to Washington, D.C. for his family). In addition, GEnie is now perceived in the Apple II community as a viable (and cheaper) alternative to CompuServe or AppleLink—Personal Edition.*

Open-Apple's *industry contacts have opened some doors. The most exciting thing happening right now in our RoundTable on GEnie is a rapid expansion in the number of companies doing online product support with us. We have representatives of companies such as Applied Engineering, Beagle Bros, StyleWare, Pinpoint, and independent developers such as Glen Bredon (ProSel) and Don Elton (Talk is Cheap) responding to questions users leave in our bulletin board about their products. To these names we are about to add Checkmate Technologies, Programs Plus, Epic Technology, and The Byte Works. And we are talking with many more.*

So, the alliance has been good for all of us. But ***Open-Apple*** *is and will remain our flagship product.*